Standard 7-3 The student will demonstrate an understanding of political, social, and economic upheavals that occurred throughout the world during the age of revolution, from 1770 through 1848.

7-3.5 Explain the impact of the new technology that emerged during the Industrial Revolution, including the changes that promoted the industrialization of textile production in England and the impact of interchangeable parts and mass production. (E, H)

Taxonomy Level: B 2 Understand/Conceptual Knowledge

Previous/future knowledge:
This is the first time students have been taught about the textile production in England and the impact of interchangeable parts and mass production.

In 3rd grade, students summarized development in industry and technology in South Carolina in the late nineteenth century and the twentieth century, including the rise of the textile industry (3-5.1).

In 5th grade, students explained how the Industrial Revolution was furthered by new inventions and technologies, including new methods of mass production and transportation (5-3.1).

In 8th grade, students will summarize the changes that occurred in South Carolina agriculture and industry during the late nineteenth century, including the growth of the textile industry in the Upcountry (8-5.3).

In Global Studies, student will explain the causes and effects of political, social, and economic transformation in Europe in the nineteenth century, including the significance of nationalism, the impact of industrialization for different countries (GS-4.4).

In US History, students will summarize the factors that influenced economic growth of the United States and its emergence as an industrial power (USHC-5.2). Students will also explain the transformation of America from an agrarian to an industrial economy (USHC-5.3) and explain the causes and effects of urbanization in late nineteenth-century America, including the movement from farms to cities (USHC-5.5).

It is essential for students to know:
The modernization of **textile technology** revolutionized industrialization. The cotton gin significantly increased cotton production following its invention in 1793. The flying shuttle advanced textile production by doubling the amount of weaving a worker could do in one day, and this machine was soon joined by the more advanced spinning jenny, which allowed one spinner to spin eight threads at a time. At first operated by hand, these machines were soon powered by the water frame. In 1779, the spinning mule was invented as a combination of the spinning jenny and water frame, and the mule produced a stronger product than its predecessors. In 1787, the water-powered power loom increased the speed of weaving yet again.

As reliance on large, expensive machines increased, factories were built to house the machines, rather than the "cottage industries" of handwork previously done at home in earlier times. Due to the increasing demand for waterpower to drive machines, factories were built near rivers or streams.

Transportation improved as the textile industry progressed. James Watt developed an efficient steam engine that was soon used to power steamboats and locomotives, leading to the building of canals and railways for trade and transportation. The railroad boom created new jobs for railroad workers and miners were needed to obtain coal to power these new engines. With less expensive means of trade and transport of goods, industries developed and trade over longer distances grew and travel for humans was easier as well.

Through the development of **interchangeable parts**, where many identical parts where produced rather than the previous process of creating unique items by hand, it became possible to mass-produce and repair many goods with the aid of machines and refined them by hand. However, this development was ongoing throughout the 19th century as instruments for precise measurement, standardization, and business processes were likewise being developed and refined. **Mass production** allowed goods to be produced for a cheaper price, making them more accessible to an increasing portion of the population.

With the development of the factory system came the division of labor, which led to increased worker productivity and increased output of manufactured goods. Unfortunately, this division of labor also made clear the division between the worker and owner classes.

It is not essential for students to know:
The dates for each invention are not an essential concept. Additionally, specific knowledge of each inventor or invention is not necessary. Focus, instead, should remain on the overall impact that the inventions had on the industry.

Assessment guidelines: The primary objective of this indicator is to **explain** the impact of the new technology that emerged during the Industrial Revolution. Therefore, the focus of assessment should be to **identify** changes that promoted the industrialization of textile production in England and **infer** the impact of interchangeable parts and mass production.